MONTHLY WEATHER REVIEW,
NOVEMBER, 1875.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

INTRODUCTION.

This general review of the meteoric conditions which prevailed in the United States during November is based upon; *first:* the synchronous telegraphic reports received at this office from the stations of the Signal Service and those of the Canadian Meteorological Service, from which are obtained the extent and direction of the movement of barometric depressions, as shown on Chart No. I; *second:* the regular monthly reports from the stations of the Signal Service, Army Post and Naval Hospitals and Volunteer Observers, which serve to determine the several meteorological elements, as shown on Charts Nos. II and III., the hours of observation being 7 A M., 2 and 9 P. M., local time.

A careful comparison of these data with corresponding reports of previous years show the following marked variations from the mean meteorological conditions of the month:

First—the low mean temperature in the districts north of the 40th parallel of latitude, where the weather, especially during the latter portion of the month, has been unusually severe, the range of temperature at several stations being more than eighty degrees Fahrenheit.

Second—the large number of areas of low barometer, and limited number of areas of high barometer.

Third—the large excess of rain on the Pacific coast, and the almost total absence of precipitation in the region of the Missouri and upper Mississippi valleys.

BAROMETRIC PRESSURE.

(1.) *In general.*—A comparison of Chart No. II with the corresponding Chart of the previous month shows the gradual movement of the areas of mean high and mean low barometer to the northeast, the former being now central on the Atlantic coast, corresponding in position to that of November, 1874, but is at least one-tenth (0.1) of an inch below the mean of that month. The rapid increase of pressure in the northern and western districts of the United States is probably due to the direct movement to the eastward of areas of high barometer, and the high latitude of the tracks of a large number of the areas of low barometer. The region of low barometer is identical with that of November, 1873, a month particularly distinguished for its low mean temperature. The distribution of pressure on the Pacific coast is the reverse of that shown on the Chart of the preceding month, the pressure having increased one-tenth (0.1) of an inch at San Diego, and from this point north to Portland decreases uniformly with an increase of latitude.

(2.) *Areas of High Barometer.*—These, though less numerous than in previous years, have in some cases been unusually marked, and accompanied by rapid and extreme changes in temperature, especially in the interior; they have approached the stations uniformly from the regions of the upper Missouri valley and Manitoba, and

with a single exception have moved toward the Atlantic with but slight changes in latitude. Nos. 1, 3 and 4 passed off the coast south of New York with no apparent change of direction, but Nos. 2, 5, 6, 7 and 8 passed more directly to the east, and after reaching the coast north of the 40° of latitude were apparently deflected to the northeast, following the general direction of the coast line until beyond the limits of the stations. The conditions attending the movements of these areas, while the centre remained within the region of observation, are generally as follows:

No. 1. The disappearance of the storm marked No. II off the south Atlantic coast was followed by increasing pressure throughout the United States east of the Mississippi river, which resulted in the gradnal development of this area over the Middle and South Atlantic States during the 5th and 6th, and the succeeding reports of the 7th show the gradual movement of this area to the east, attended by clear or fair weather throughout the greater portion of the United States.

No. 2 moved slowly from north of the Lake region over New England during the 7th, 8th and 9th, following the direction of the coast line in advance of the storm marked as No. VI.

No. 3 was first observed on the morning of the 8th as central near the western boundary of Dakota, and moved to the eastward during the succeeding eight (8) hours, after which its course was directly southward to the west Gulf coast, where it was central on the 10th. A severe "Norther" occurred on the Texas coast during the 9th, the intensity of which was increased by the tropical storm then central in the Gulf. After reaching the Gulf coast its course changed from south to east, and followed the Gulf coast line to south Atlantic immediately in rear of depression No. VI.

No. 4 followed closely in the rear of the storm of the 15th–16th, causing a rapid increase of barometric gradients, clear and cold weather in the districts east of the Mississippi, the line of greatest pressure extending from the Platte valley to the coast of North Carolina during the 16th, 17th and 18th.

Nos. 5 and 6 were observed in the upper Missouri valley, the former preceding and the latter following the area of low barometer marked on the Chart as No. XII. The tracks of these areas lead more directly to the east than that of the mean direction of areas of high barometer. The precipitation which occurred through the Southern States and Ohio valley was favored by the distribution of pressure, which caused east and south winds around the former, then central on the Atlantic coast, and northerly winds on the east of the latter, then central in the Mississippi valley.

No. 7. The telegraphic reports of the 26th indicated the advance of this area from the region west of Hudson's Bay towards Lake Superior, and the succeeding reports show that it passed to the St. Lawrence valley, and thence to the northeastward during the 27th and 28th, attended by decidedly cold weather in the northeastern sections of the United States, and immediately preceding the last severe storm of the month.

No. 8 was central in the Missouri valley near Yankton at midnight of the 28th, and the following unusually high readings of the barometer were reported: Yankton, 31.08; Fort Sully, 31.00; Breckenridge, 30.91; Bismarck, 30.89; Pembina, 30.90; that at Yankton being the highest observed since the establishment of the Signal Service. The high and dangerous winds which preceded the advance of this area towards the Lake region show that the severity of storms depend more upon the relative difference of pressures than upon the low barometric readings of the central area. A severe "Norther" occurred on the Texas coast on the 29th, and decidedly cold weather prevailed throughout the United States, the temperature falling below freezing as far south as Shreveport and the interior of the Gulf States.

(2.) *Areas of Low Barometer.*—The unusually large number of barometric depres-

sions observed during the month have been traced on Chart No. I, and the mean hourly movement of each is given in the table. In comparing this Chart with those of preceding months it will be seen that the number of depressions occurring wholly within the United States has increased with the approach of winter. The direction of the movement and the mean latitude of the course of these depressions seem to determine the general character of the disturbance, and they may therefore be classified as follows: first, those originating in the Northwest, and passing to the east over the high latitudes, accompanied by southerly winds and slight disturbances in the several districts of the United States; second, those originating in lower latitudes, and passing to the east within the limits of the United States, attended in the northern districts by sudden and severe climatic changes, northeast winds, which back to the northwest as the depression passes to the east of the coast line. The following detailed account of each depression is given in the order of occurrence:

No. I developed in the Ohio valley on the afternoon of the 1st, and passed rapidly to the south Atlantic, causing areas of light rain and snow in the Middle and New England States, while clear and warm weather continued in the southern sections of the country.

No. II. This extended depression was first observed on the morning of the 1st, central in the eastern portion of Wyoming Territory; during the succeeding eight hours its centre passed southeastward to Kansas, after which two distinct depressions were observed one moving directly to the east during the 2d, 3d and 4th, accompanied by rain in the northern sections, and high winds on the middle Atlantic coast; the other depression passed directly south during the 2d and 3d, the progressive movement being retarded until midnight of the 4th, when the course changed from south to east, the central area becoming defined as an elongated ellipse, the longer axis bearing towards the northeast as the depression passed rapidly from the Mississippi valley to the Atlantic. Heavy rains prevailed in the Southern States during the 3d and 4th, and marine reports show that a violent hurricane from the Northwest occurred on the 5th in latitude 32° longitude 78°.

No. III. A severe storm in the Gulf Stream, at no time within the limits of the United States, and only approximately traced, during the 2d and 3d, when the centre followed the general direction of the coast line and near Sydney, the barometer at that station reading 29.20 on the afternoon of the 2d.

No. IV. The midnight telegraphic report of the 5th indicated the approach of a tropical storm towards the Texas coast, accompanied by northeast gales and heavy rains in the west Gulf. This depression became more extended as it advanced to the east with increasing velocity, the region of precipitation including the entire Southern and Middle States.

No. V. Central in the upper Missouri valley on the night of the 6th, when the barometer was below the mean in the Northwest, upper Mississippi and lower Missouri valleys, passed to the north of the Lake accompanied by slight changes in temperature, but was followed by rapidly rising barometer and low temperature in the Northwest and Upper Lake region on the 8th and 9th.

No VI. The second tropical storm of the month was central as a slight depression near Indianola on the night of the 8th, and during the succeeding day moved slowly to the eastward, causing heavy rains on the Gulf coasts. The midnight reports of the 9th show a trough-like depression from the Gulf to Lake Superior, with two central areas, one near the coast, the other near Lake Erie. These depressions moved east and northeastward, uniting on the night of the 10th, when the storm-centre was near Boston. Severe gales occurred on the Atlantic coast as this depression passed to the northeastward, the central area becoming more contracted, and the gradient increasing rapidly in

its western quadrants. Cautionary Signals were displayed on the Atlantic coast from Hatteras to Eastport in advance of this storm.

Nos. VII and VIII originated in the extreme Northwest, and moved to the north of the Lake region during the 10th, 11th and 12th, without producing marked changes in the meteoric conditions.

No. IX. A depression in the Northwest on the night of the 11th which was apparently divided by the advance of an area of high barometer from the upper Missouri valley, forming No. VIII, already referred to, and No. IX, which moved slowly from the Southwest to the Lower Ohio valley, where it was central on the morning of the 13th, as an area of precipitation, and afterwards to the Atlantic coast, dividing on the morning of the 14th in the upper Ohio valley, and uniting after the minor depressions had passed to the eastern coast. Brisk and high northeast winds, accompanied by sleet and snow, prevailed in the districts north of the centre, and rain prevailed generally throughout the Southern States.

No. X. Central in the Northwest on the morning of the 14th, while the preceding depression was central on Lake Erie. It moved almost directly to the east over the northern portion of the Lake region and St. Lawrence valley to the Gulf of St. Lawrence, as one of the severe storms of the month, disastrous gales being reported from the Lakes on the 14th and 15th, and in the north Atlantic during the 15th and 16th. The barometer fell rapidly as the centre advanced, and the unusually low reading of 28.65 was observed at Sydney on the morning of the 17th. The winds became more dangerous after shifting to the north and west, and the barometric gradient was one inch to 400 miles when the centre was near Cape Breton

No. XI was central in the extreme Northwest on the afternoon of the 17th, and the barometer was generally below the mean at the western stations. The course of this depression differs but slightly from the preceding one, while the reports show less marked changes. In the former the barometer fell rapidly with the easterly movement; in the latter the lowest barometric reading was observed in the northwest.

No. XII. The latitude of the origin and the track pursued by this depression, are approximately the same as in the two preceding depressions. It passed from the upper Mississippi valley to the Atlantic coast, during the 22d and 23d, causing heavy rains and high winds in advance of the center, and gales on the Atlantic coast during the 24th. The extreme low temperature which, followed this depression, may be more properly referred to the marked area of high barometer, which immediately followed.

No. XIII. The barometer was unusually low in the western territories, on the midnight of the 24th, when this depression developed, passing rapidly, first to the southeast, afterwards to the northeast as a severe storm, the area of rain including the entire country east of the Rocky Mountains. Signals were ordered, and generally verified, at the stations on the lakes and on the Atlantic coast, north of Cape Hatteras.

No. XIV moved rapidly from Nebraska to the Gulf of St. Lawrence during the 27th, 28th and 29th, and was the most violent storm of the month, the winds increasing in force until the center passed to the north Atlantic. Marine disasters occurred in the Gulf of St. Lawrence, causing great loss of life and property. The signals ordered at the several stations for this storm, were observed, and are reported, by those interested in navigation, as having been particularly advantageous to the shipping interests of the country.

TEMPERATURE OF THE AIR.

The isothermal lines on Chart No. II show the mean distribution of temperature for the month, and, also, that the decrease of temperature, with the increase of latitude, is uniform, and averages, in the districts east of the Rocky Mouhtains, 2° for each

degree of latitude. The table shows that the temperature has been decidedly below the mean in New England, the St. Lawrence valley and Minnesota; and above the mean in the Gulf states. The temperature has fallen below freezing at all stations north of a line passing from Shreveport north of Vicksburg, following the 33d parallel. The temperature on the Pacific coast was slightly above the mean, and north of San Diego, averaged 12° higher than the temperature of the corresponding latitude on the Atlantic coast.

Ranges of Temperature.—The ranges of temperature has been unusually great in the interior, that of Breckinridge being 87°: Cheyenne, 80°; Dodge City, 84°; Duluth, 76°; Mt. Washington, 77°; North Platte, 76°; Malone, 70°; Omaha, 75°; Pembina, 65°; St. Paul, 80° and Yankton, 80°.

PRECIPITATION.

Chart No. III shows, in a graphic manner, the precipitation for the month. This has been mostly in the form of rain south of the 42d parallel of latitude. North of this line considerable snow has fallen, particularly in Canada and the northern portion of the Upper Lake region. Regions of large precipitation are shown in Nova Scotia, portions of New England and New Jersey, from the Gulf northward to the lower Ohio valley and on the Pacific coast. The heaviest rains have fallen in the last-named district, amounting to 7.27 inches at San Francisco and 15.75 at Portland, Or, which is very much in excess of the mean for the month. The largest rainfalls east of the Rocky mountains have occurred in the central Mississippi valley, amounting to 7.96 inches at Cairo and 9 36 at Memphis. A large deficiency is noticeable in the Northwest, and at several stations in Kansas no rain or snow fell during the entire month.

Rainy Days.—The number of days during the month on which rain or snow fell averages as follows: In New England, the Middle States, the Ohio valley and Tennessee, 12; South Atlantic and Gulf States, 11; Lake region, 14; Northwest, 6.

Cloudy Days.—The average number of cloudy days (other than those on which rain or snow fell) is: In New England, 3; Middle Atlantic States, 2; South Atlantic States, 6; Gulf States, Ohio valley and Tennessee, 4; Lake region, 5; Northwest, 7.

RELATIVE HUMIDITY.

The mean relative humidity for the month ranges between 60 and 70 per cent, in the Northwest and thence southward to northern Texas. At nearly all of the stations elsewhere east of the Rocky mountains the mean for the month ranges between 70 and 80 per cent., except in Florida and on the Gulf coast, where it varies from 79 to 85. At the Rocky mountain stations the figures run from 54 at Santa Fe to 63 at Cheyenne. On the summit of Mt. Washington the mean is 91 and on Pike's Peak 77. This moist atmosphere at these elevated stations is due to their very low temperature.

WINDS.

The prevailing winds for the month are indicated by the arrows, flying with the wind, on Chart No. II. West and northwest winds have predominated in the Middle States, New England and the Lower Lake region, and northerly winds in Indian Territory, Arkansas, Tennessee and the Ohio valley, central Mississippi and lower Missouri valleys. Southerly winds have prevailed in the Gulf States, but elsewhere variable winds.

The total movements of the air for the month, independent of direction, average as follows in the various districts: New Jersey and New England coasts, 8,740 miles; interior of New England and the Middle States, 4,600; South Atlantic and Gulf coasts,

6,250; interior of Southern States, 3,515; Lake region, 7,100; Ohio valley, 4,750; Northwest, 6,910.

The following are the maximum velocities at several stations: Mt. Washington, November 17th, 8 a. m., 150 miles per hour; 12:22 p. m., 144; 29th, 3:40 p. m, 168 miles per hour; 5 p. m., 156, and 6 p. m., 170; the highest velocity reported from any station of the Signal Service. A velocity of 65 miles per hour occurred at Boston during the storm of the 28th and 29th, which is also the highest velocity reported from that station. A velocity of 54 miles per hour is reported from Indianola during the "norther" of the 29th.

WATER TEMPERATURES.

The monthly maximum and minimum temperatures of water in the lakes, rivers and on the Gulf and Atlantic coasts, from observations taken at the bottom, may be found in the table on Chart No. II. These figures show that the air has been colder than the water at nearly all stations, the only exceptions being Key West, San Francisco, Toledo, Savannah and St. Louis, for which places the mean monthly temperature of the two elements is the same. It is, however, only in the extreme northern sections of the country that a considerable difference is shown, and at most stations in the Southern States and on the Western rivers the water has averaged but two degrees warmer than the air. At the stations in the northern portion of the Upper Lake region, on Lake Champlain and the coast of Maine the water has averaged from seven to thirteen degrees above that of the air.

NAVIGATION.

On Chart No. III is given the usual table, showing the highest and lowest watermarks, from which it will be seen that the Ohio and the lower Mississippi rivers rose slowly during the latter portion of the month, and that the upper Mississippi and lower Missouri declined and were unusually low at the close of the month.

The following notes, obtained from the reports of the Observers, give the time of the closing of navigation, condition of harbors as regards the ice, and depth of water in rivers: St. Paul, Minn., anchor ice in river 16th and 17th; navigation closed 17th; frozen over 21st. La Crosse, the water was low on the Eau Claire Rapids 8th; floating ice 17th, 18th 19th and 20th; closed 22d. Dubuque, Iowa, ice in river on the 8th; full of ice 19th and 21st. Davenport, Iowa, floating ice 21st. Rock Island, Ill., the ferry-boat went into winter quarters 27th; river closed 29th. On the 27th the water was lower in the Mississippi river than ever before known. Keokuk, Iowa, ice in river sufficient for skating 21st; floating ice 22d, 24th, 26th, 29th and 30th; navigation closed 27th; not sufficient water for boats to run on the 30th. St. Louis, Mo., floating ice 30th. At Fort Sully and Yankton, D. T., the Missouri river was frozen up the 15th. At Omaha, Neb., there was floating ice 16th, 17th and 19th; river gorged 18th and 20th; frozen over the 24th. Leavenworth, Kan., frozen over the 23d. Plattsmouth, Neb., floating ice 15th and 16th and west channel gorged 17th and 21st. At Breckenridge, Minn., the Red River of the North closed on the 3d. Moorhead, Minn., floating ice on the 1st; frozen over 16th. Pembina, D. T., navigation closed on the 4th Hennepin, Ill., the Illinois river was closed by ice 24th. Wappinger's Falls, N. Y., the Hudson about closed 30th South Hartford, N. Y., canal navigation about closed 30th. Brownsville, Penn., creeks frozen over 30th West Charlotte, Vt., anchor ice in Lake Champlain, 30th. Shelburne, N. H., the Androscoggin was crossed by persons on foot 22d and with horses 27th. Gardiner, Me., the Kennebec river was closed 22d. Alpena, Mich., Thunder Bay river was frozen over 22d and the harbor frozen the 29th Cleveland, Ohio, ice formed on the canal and river 30th.

VERIFICATION OF "PROBABILITIES" AND CAUTIONARY SIGNALS.

A critical comparison of the published "Probabilities" with the following reports show that, on the average for all the districts of the United States, 92.18 per cent. of the predictions have been verified. During the month 188 Cautionary Signals have been displayed at the several ports on the Lakes and Atlantic coast, of which 75 per cent. have been fully justified by the occurrence of dangerous winds. Reports have been received from various sources showing that vessels were retained in port by the display of the signals, thereby avoiding the dangers of the violent gales during the latter portion of the month. Storm warnings were forwarded to the Canadian stations for storms of the 10th, 14th, 17th, 23d, 25th, 26th, 28th and 29th.,

ATMOSPHERIC ELECTRICITY.

(1) *Thunder Storms.*—These have been more numerous for the month than has occurred generally in the areas of low barometer; those particularly reported are as follows: At Detroit, Mich., on the 1st; Bloomfield, Wis., 2d; Louisville and Benersville, Ky., Indianapolis and Fort Wayne, Ind., Memphis, Tenn., Marion, Westerville, Kenton, Bethel, Carthagena, Jacksonburg, Ringgold and Olive Furnace, Ohio, Brownsville and Canonsburg, Penn. and Alta Vista, Va., 3d; Smithville, Tenn., 3d, 13th and 26th; Wilsonville, Ala and Point Pleasant, La., 4th, 18th and 23d; Montgomery, Ala., 4th and 18th; Mobile, Ala., 6th and 7th; Charleston, S. C., 7th and 21st; Austin, Texas, 8th, 23d and 28th; Corsicana, Texas, 8th, 28th and 29th; Cairo, Ill. and Nashville, Tenn., 13th; Forsyth, Ga., Asheville, N. C., Greenville and Spartansburg, S. C., 19th; Wytheville, Va., 20th; Goldsboro', Wilmington and Smithville, N. C. and Shreveport, La., 23d; Afton, Iowa, Atchison, Kan. and Rolla, Mo., 25th; Belmont Farm, Texas 27th.

(2) *Auroras.*—The most brilliant displays occurred on the 18th, 21st and 22d, being generally observed at the northern stations from Maine to the upper Mississippi river. In detail they have been seen as follows: At Escanaba, Mich., on the 1st; North Argyle, N. Y., Carthegena, Ohio, and Lunenburgh, Vt., 2d; Buffalo, N. Y., 5th; Troy, N. Y., 6th; Detroit, Mich., 7th; Corsicana, Texas, and Eastport, Me., 8th; Rockford, Iowa, 12th; Winchester, Ky., 15th; Corsicana, Texas, 17th; Omaha, Neb., Dodge City and Burlingame, Kan., 18th; Mt. Forest, Can., Fall River, Springfield and Boston, Mass., Detroit, Alpena, Port Huron, Marquette and Escanaba, Mich., New Germantown, N. J., Stapleton and Malone, N. Y., Duluth, Minn., Burlington, Vt., and La Crosse, Wis., 21st; Waltham, Springfield and Boston, Mass., North Argyle, N. Y., Woodstock and Lunenburgh, Vt., and Utica, Wis., 22d; Nora Springs, Iowa, 25th; Gardiner and Eastport, Me., and Springfield, Mass., 29th; Boston, Mass., 30th.

OPTICAL PHENOMENA.

(1) *Solar Halos* were observed in Connecticut on the 7th; Delaware, 3d and 13th; Illinois, 2d, 12th, 18th, 19th, 20th, 22d, 25th, 27th, 28th and 30th; Indiana, 10th; Iowa, 10th, 15th, 21st and 28th; Kentucky, 8th, 24th and 29th; Louisiana, 27th; Maine, 9th and 20th; Minnesota, 16th, 19th, 20th, 23d and 26th; Nebraska, 13th and 19th; New Hampshire, 5th, 9th, 13th, 20th and 28th; New Jersey, 7th; New York, 3d, 6th, 7th, 9th, 13th, 18th and 19th; Ohio, 2d, 5th, 9th, 12th, 18th, 24th and 29th; Pennsylvania, 3d, 7th and 30th; Tennessee, 13th; Vermont, 18th; Virginia, 13th, 22d and 30th.

(2) *Lunar Halos* were observed in Alabama on the 3d; Canada, 13th; Connecticut, 7th and 9th; Illinois, 7th, 8th, 10th, 11th and 21st; Indiana, 5th, 10th, 11th, 12th and 25th; Iowa, 4th, 6th, 7th, 8th, 10th, 11th, 12th and 13th; Kentucky, 6th, 8th and 15th; Louisiana, 8th; Maine, 9th; Maryland, 6th and 13th; Massachusetts, 3d, 7th, 9th and 12th; Michigan, 8th, 10th, 12th, 13th and 14th; Minnesota, 9th; Missouri, 7th; Nebraska, 7th, 11th, 12th, 13th and 17th; New Hampshire, 9th; New Jersey, 8th, 9th, 10th, 12th, 14th and 17th; New York, 7th, 9th, 11th, 12th, 15th, 18th and 20th; North Carolina, 13th and 14th; Ohio, 6th, 7th, 11th and 12th; Pennsylvania, 6th and 9th; Texas, 14th; Vermont, 9th, 13th and 14th; Virginia, 13th, 14th and 15th.

(3) *Mirage.*—Fort Niagara, N. Y., on the 13th; New London, Conn., 6th, 18th and 22d, and Atlantic City, N. J., 30th.

MISCELLANEOUS PHENOMENA.

(1) *Prairie and forest fires* were reported at Wytheville, Va., 2d and 3d; Corsicana Texas, 9th; Breckenridge, Minn., 6th, 12th and 20th; Dodge City, Kan., 1st, 14th, 17th, 24th and 30th; Ellinwood, Kan., 12th, 21st and 24th; De Soto, Neb., 10th to 18th, and Richmond, Neb., 18th to 30th.

(2) *Meteors* were reported at Newport, R. I., 22d; Morgantown, W. Va., 22d and 25th; Logansport, Ind., 8th; Jacksonville, Fla., 17th and 20th; Milford, Del., 8th and 21st; Forsyth, Ga., 20th; Wyanet, Ill., 20th; Lyndon, Ill., 6th, 21st and 30th; Belvidere, Ill., 22d; Somonauk, Ill., 5th and 21st; Rock Island, Ill., 27th; Davenport, Iowa, 1st, 3d, 5th, 7th, 9th, 16th, 23d and 28th; Muscatine, Iowa, 26th; Fort Madison, 6th; Dodge City, Kan., 11th, 18th and 19th; Ellinwood, Kan., 8th; Benersville, Ky., 12th and 21st; Point Pleasant, La., 20th and 22d; Woodlawn, Md., 22d; Fallston, Md., 25th, Florida, Mass., 4th, 20th and 27th; Fall River, Mass., 23d; Corning, Mo., 10th and 11th; Howard, Neb., 24th and 30th; Atco, N. J., 17th, 24th and 25th; New York City, 20th and 29th; Waterburgh, N. Y., 17th; North Volney, N. Y., 4th; Flushing, N. Y., 22d; Carthagena, Ohio, 8th; Canonsburg, Penn., 25th; Woodstock, Vt., 22d; Strafford, Vt., 27th; Wautoma, Wis., 24th.

(3) *Polar Bands*, Wytheville, Va., 13th, 14th, 17th, 24th and 29th; Cleveland, Ohio, 29th; Charleston, S. C., 4th; Smithville, N. C., 10th and 13th; Breckenridge, Minn., 10th and 17th; Dodge City, Kan., 14th and 30th; Fort Madison, Iowa, 15th; Iowa City, Iowa, 1st, 4th, 13th, 25th and 30th; Point Pleasant, La., 4th; Freehold, N. J., 18th; Richmond, Va., 28th.

(4) *Earthquakes* were reported at Knoxville, Tenn., 12th: San Jose, Cal., 14th; San Francisco, Cal., 14th and 27th; Leavenworth, Burlingame, (at 4:40 a. m., motion from SW. to NE.,) Lawrence and Manhattan, (about 5 a. m., motion from W. to E., and lasting a minute,) Kan., 8th; Forsyth, Gainesville, Macon and Augusta, Ga.; Aiken, (at 10 p. m., motion from S. to N.,) Spartanburg and Columbia, S. C., 1st., 10:20 p. m., sufficient shock to shake doors and windows.

PUBLISHED BY ORDER OF THE HON. WM. W. BELKNAP, SECRETARY OF WAR.

Albert J. Myer

Brig. Gen. (Bvt. Assg^{t},) Chief Signal Officer, U. S. A.

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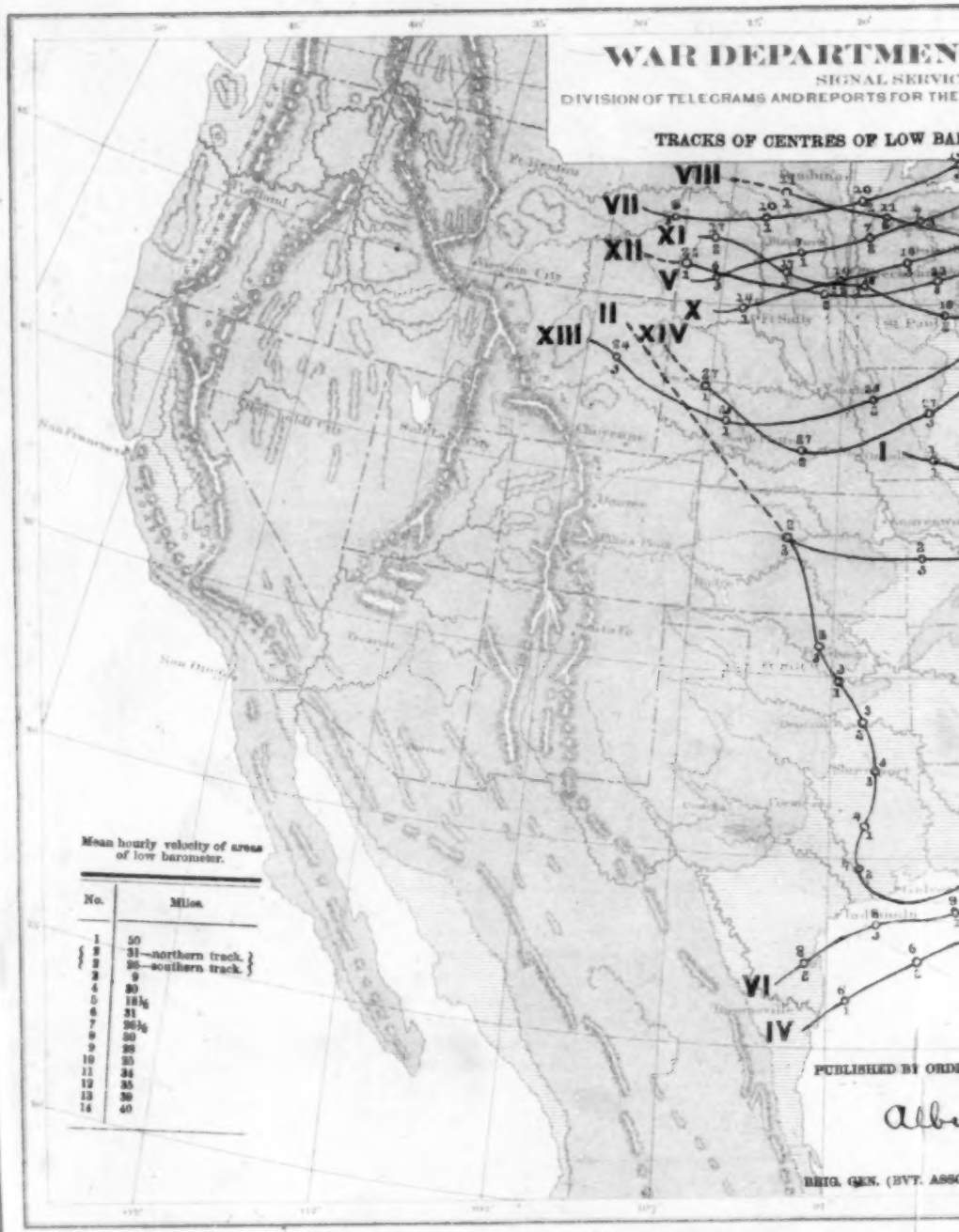
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XI
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IV
Mean hourly velocity of areas of low barometer.
No. | Miles.
1 | 50
2 | 31—northern track.
3 | 26—southern track.
4 | 9
5 | 30
6 | 18½
7 | 31
8 | 26½
9 | 30
10 | 28
11 | 35
12 | 34
13 | 35
14 | 30
40
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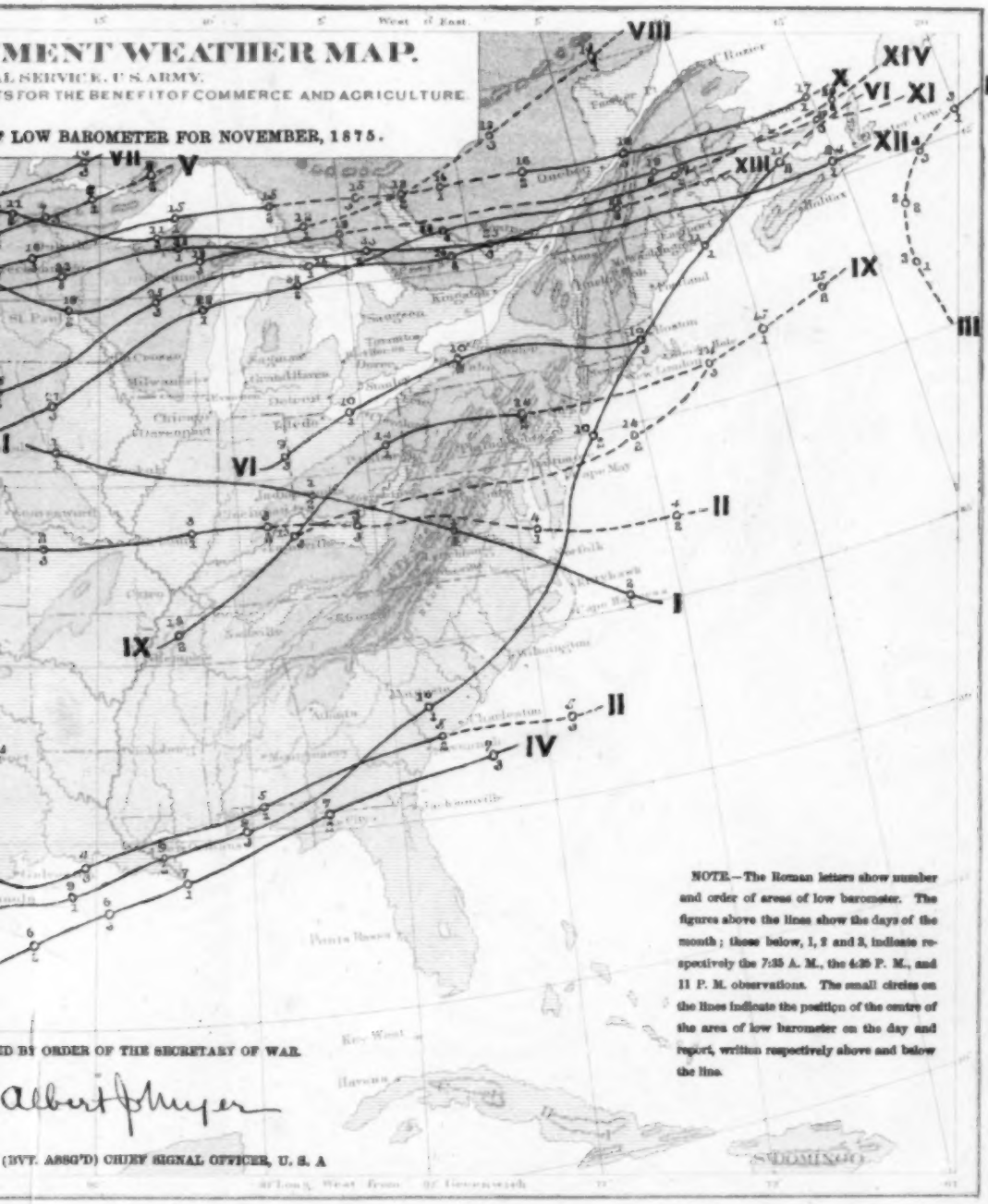
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L SERVICE, U. S. ARMY.
TS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.
F LOW BAROMETER FOR NOVEMBER, 1875.
VIII
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III
VII
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NOTE.—The Roman letters show number and order of areas of low barometer. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the centre of the area of low barometer on the day and report, written respectively above and below the line.
ED BY ORDER OF THE SECRETARY OF WAR.
Albert J. Myer
(BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A

WAR DEPARTMENT
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TRACKS OF CENTRES OF LOW BAR
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IV
Mean hourly velocity of areas of low barometer.
No. | Miles
1 | 50
2 | 31—northern track.
3 | 26—southern track.
4 | 20
5 | 19½
6 | 21
7 | 26½
8 | 30
9 | 28
10 | 25
11 | 24
12 | 25
13 | 30
14 | 40
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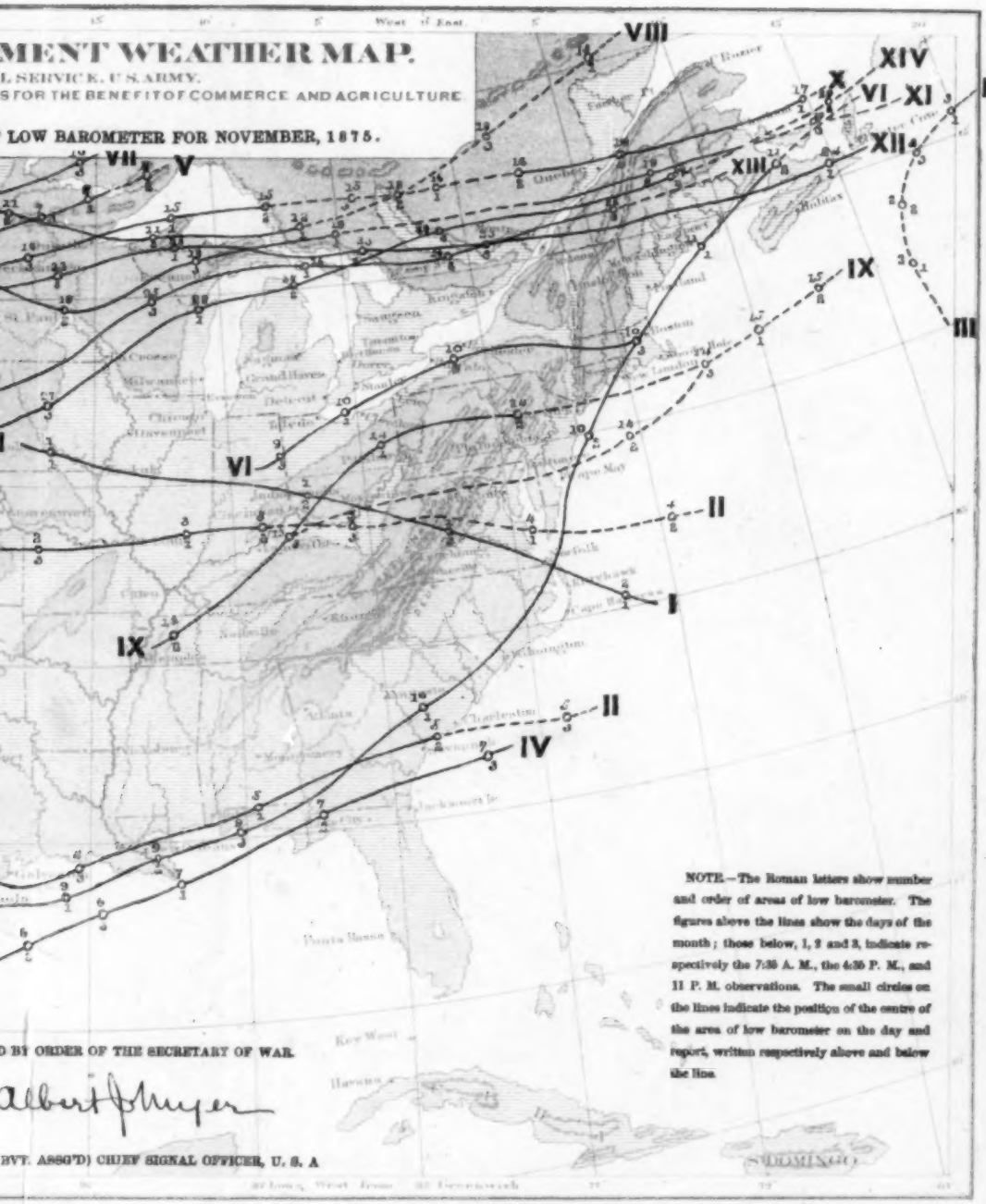
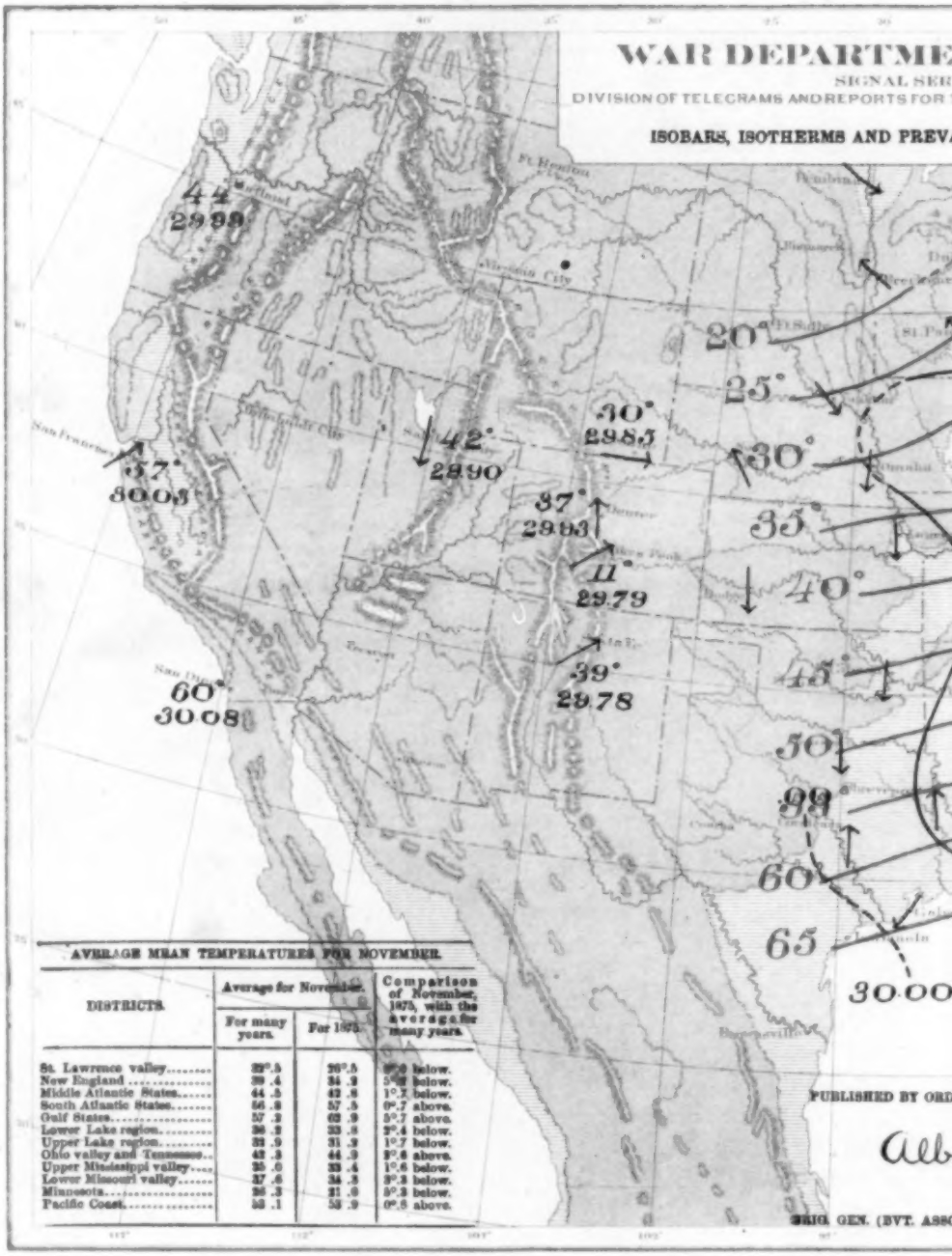
No. I.


MENT WEATHER MAP.
L SERVICE, U S ARMY.
S FOR THE BENEFIT OF COMMERCE AND AGRICULTURE
LOW BAROMETER FOR NOVEMBER, 1875.
VIII
XIV
X
VI
XI
III
XII
VII
V
XIII
IX
III
VI
II
I
IX
II
IV
NOTE.—The Roman letters show number and order of areas of low barometer. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the centre of the area of low barometer on the day and report, written respectively above and below the line.
D BY ORDER OF THE SECRETARY OF WAR.
Albert J. Myer
BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A



AVERAGE MEAN TEMPERATURES FOR NOVEMBER.

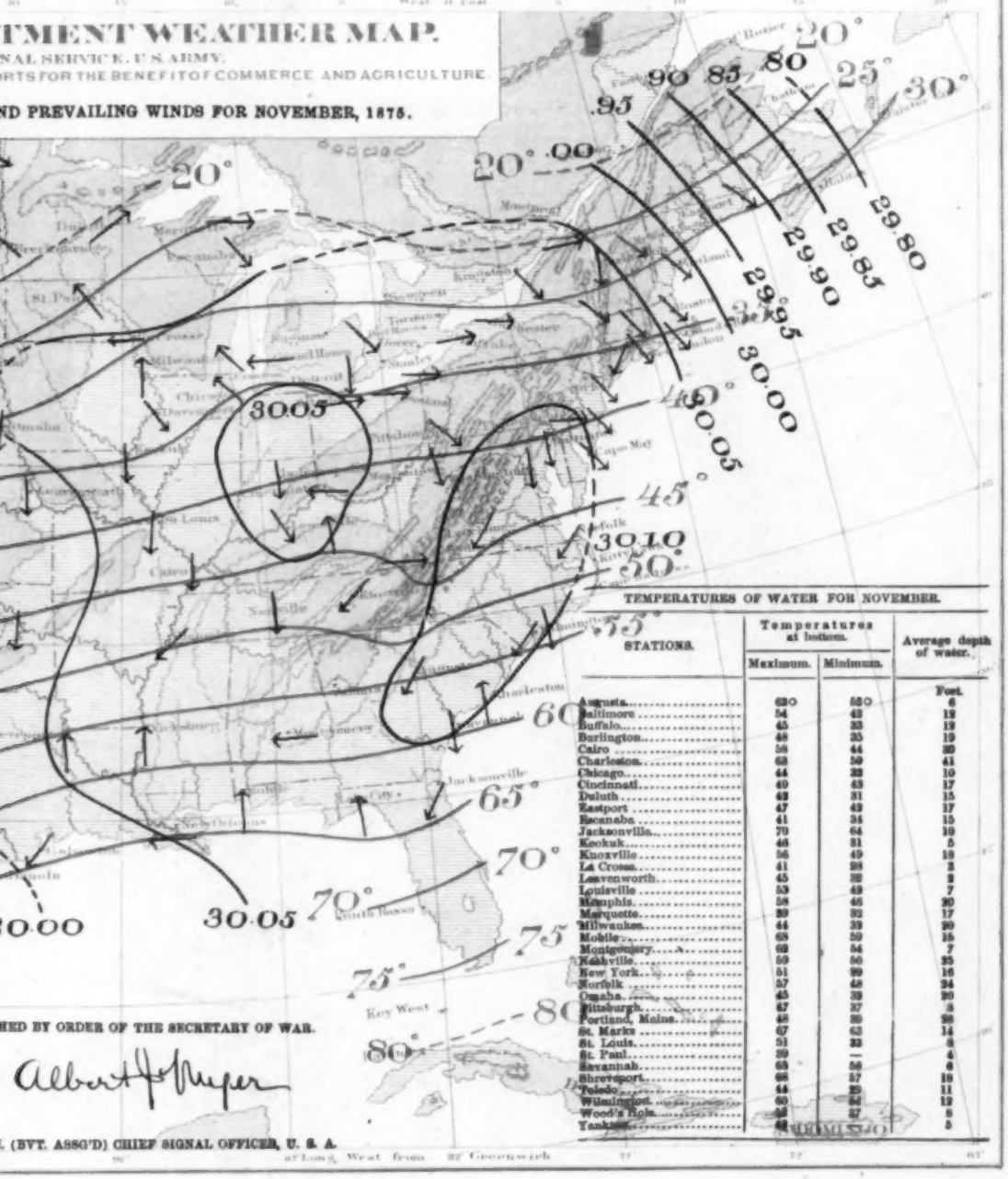
DISTRICTS.	Average for November.		Comparison of November, 1875, with the average for many years.
	For many years.	For 1875.	
St. Lawrence valley	29°.5	26°.5	3°.0 below.
New England	39 .4	34 .9	5°.5 below.
Middle Atlantic States	44 .5	42 .8	1°.7 below.
South Atlantic States	56 .8	57 .5	0°.7 above.
Gulf States	57 .2	62 .9	5°.7 above.
Lower Lake region	30 .2	33 .8	2°.4 below.
Upper Lake region	33 .9	31 .3	1°.7 below.
Ohio valley and Tennessee	42 .3	44 .9	2°.6 above.
Upper Mississippi valley	35 .0	33 .4	1°.6 below.
Lower Missouri valley	37 .6	34 .3	3°.3 below.
Minnesota	30 .3	27 .0	3°.3 below.
Pacific Coast	53 .1	53 .9	0°.8 above.

TMENT WEATHER MAP.

NAL SERVICE, U. S. ARMY.

RTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE

ND PREVAILING WINDS FOR NOVEMBER, 1875.



TEMPERATURES OF WATER FOR NOVEMBER.

STATIONS.	Temperatures at bottom.		Average depth of water.
	Maximum.	Minimum.	
			Feet.
Augusta	820	810	6
Baltimore	54	43	12
Buffalo	45	33	13
Burlington	48	35	19
Cairo	58	44	20
Charleston	68	59	41
Chicago	44	32	10
Cincinnati	49	43	17
Duluth	42	31	15
Eastport	47	43	17
Escanaba	41	34	15
Jacksonville	70	64	10
Keokuk	48	31	5
Knoxville	56	49	18
La Crosse	41	33	2
Leavenworth	45	32	9
Louisville	53	49	7
Memphis	58	46	20
Marquette	39	32	17
Milwaukee	44	33	20
Mobile	68	59	15
Montgomery	62	54	7
Nashville	50	50	25
New York	51	39	16
Norfolk	57	45	24
Omaha	42	32	20
Pittsburgh	47	37	8
Portland, Maine	46	39	20
St. Marks	67	63	14
St. Louis	51	33	6
St. Paul	39	—	4
Savannah	68	58	6
Shreveport	66	57	10
Toledo	44	39	11
Wilmington	60	54	12
Wood's Holl	52	47	8
Yankton	41	[illegible]	5

HED BY ORDER OF THE SECRETARY OF WAR.

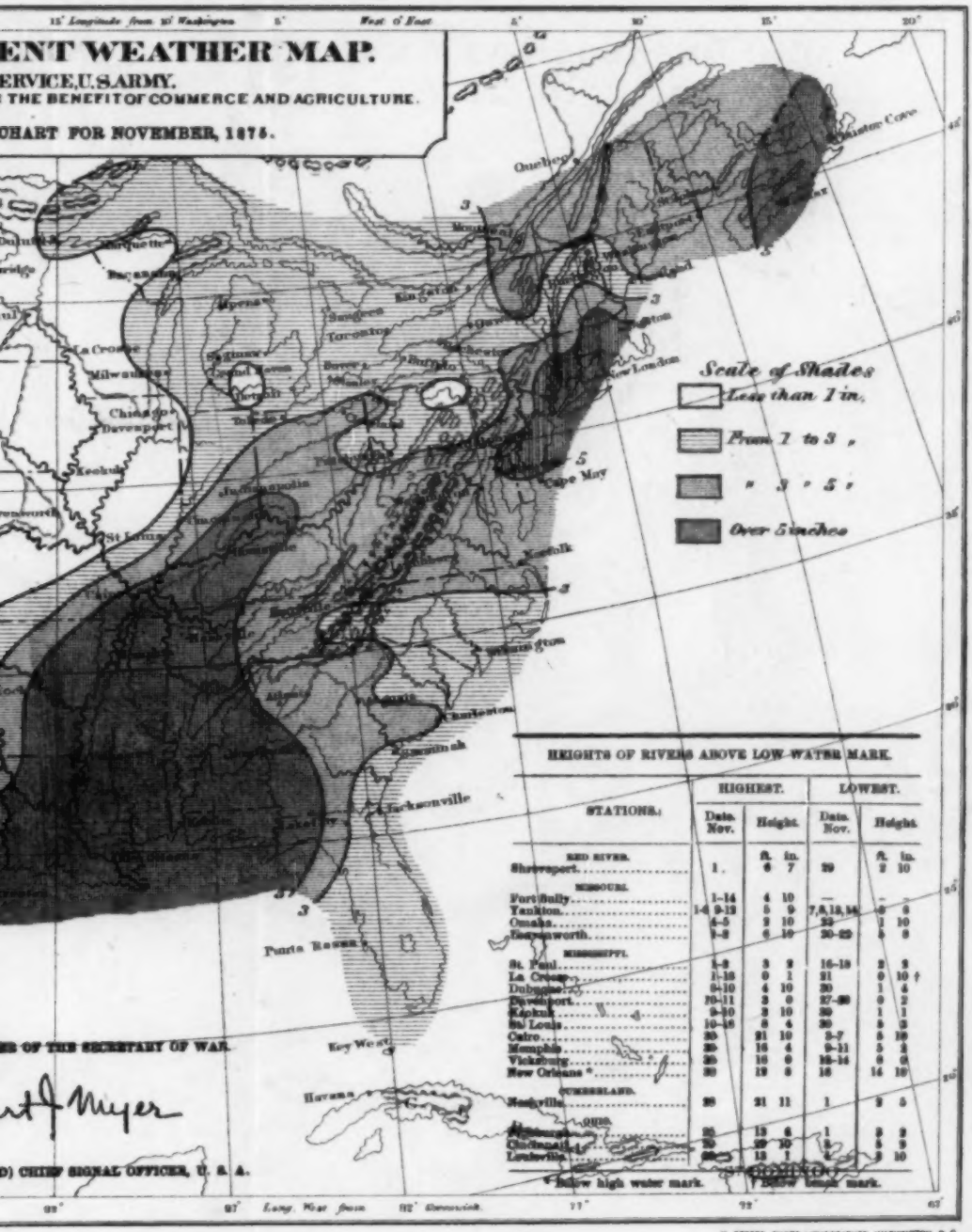
Albert J. Myer

L. (BVT. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A.

AVERAGE PRECIPITATION FOR NOVEMBER.

DISTRICTS.	Average for November. For many years.	Average for November. For 1874.	Comparison of November, 1874, with the average for many years.
	Inches.	Inches.	
St. Lawrence valley	2.70	2.50	Very small deficiency.
New England	3.85	4.10	Small excess.
Middle Atlantic States	3.50	4.40	Excess.
South Atlantic States	3.00	2.60	Small deficiency.
Eastern Gulf States	3.65	5.10	Excess.
Western Gulf States	4.25	4.55	Small excess.
Lower Lake region	3.25	2.25	Deficiency.
Upper Lake region	2.40	1.70	Deficiency.
Ohio Valley and Tennessee	2.40	5.45	Large excess.
Upper Mississippi Valley	1.00	0.60	Large deficiency.
Lower Missouri Valley	1.40	0.40	Large deficiency.
Minnesota	1.85	0.75	Large deficiency.
Pacific Coast	3.00	8.40	Very large excess.

No. III.



HEIGHTS OF RIVERS ABOVE LOW-WATER MARK.

STATIONS.	HIGHEST. Date. Nov.	HIGHEST. Height.	LOWEST. Date. Nov.	LOWEST. Height.
		ft. in.		ft. in.
RED RIVER.				
Shreveport	1	6 7	29	2 10
MISSOURI.				
Fort Sully	1–14	4 10	—	—
Yankton	1–6 9–13	5 9	7,8,13,14	0 6
Omaha	4–5	2 10	23	1 10
Tarkeyworth	1–2	6 10	30–29	4 8
MISSISSIPPI.				
St. Paul	1–2	3 9	16–18	2 2
La Crosse	1–13	0 1	21	0 10 †
Dubuque	8–10	4 10	20	1 4
Davenport	10–11	3 0	27–28	0 2
Keokuk	9–10	3 10	29	1 1
St. Louis	10–16	8 4	30	4 3
Cairo	20	21 10	3–7	6 10
Memphis	20	16 4	9–11	5 2
Vicksburg	20	16 0	13–14	0 6
New Orleans *	20	19 6	16	14 10
CUMBERLAND.				
Nashville	20	21 11	1	9 5
OHIO.				
Pittsburg	25	19 6	1	2 2
Cincinnati	25	29 10	1	4 9
Louisville	26	13 1	4	2 10

* Below high water mark. † Below low water mark.

ER OF THE SECRETARY OF WAR.

Myer

D) CHIEF SIGNAL OFFICER, U. S. A.

H. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.